

11.—Contributions to the Knowledge of Western Australian Gramineae

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Manuscript received—22nd February, 1961

Twenty-one species, including two introductions, are recorded for the first time. Four records are confirmed. Supplementary records for a further twenty-six rarely collected or recently described species and notes on taxonomy and distribution are included.

Introduction

Much of the knowledge of West Australian grasses has resulted from a comprehensive account of the family by Gardner (1952). These additions from the Kimberley District are based on collections by Miss N. T. Burbidge, Division of Plant Industry, C.S.I.R.O., Canberra, made during seed collecting visits in April, 1956 and 1958, Mr. E. C. B. Langfield, Division of Land Research and Regional Survey, Kimberley Research Station, C.S.I.R.O., and Mr. D. W. Rust, owner of Karunjie Station, East Kimberleys. Also, surveys conducted by the Division of Land Research and Regional Survey, C.S.I.R.O. in various parts of the Kimberleys during the dry seasons of 1949, 1952, 1954 and 1959 and wet season collections by the author in 1955 yielded further material.

The original specimens of all cited collections are located in the herbaria of the C.S.I.R.O., Canberra. The herbaria to which duplicates have been donated are indicated after the citations or, if one or more institutions have received duplicates of several collections of a species, at the end of a series of citations. The abbreviations used are those given in the Index Herbariorum ed. 4 (1959).

New Records

The following species are given as new records for Western Australia.

Aristida capillifolia Henr., Meded. Herb. Leid. 2:298 (1932).

New York Pool, 35 miles N.E. of Karunjie Station, among boulders on sandstone scarp near waterfall, *Lazarides* 3088, 29.vi.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US); Durack Range, 8.5 miles S.E. of Bedford Downs Station, occasional in small stony creek in gorge of sandstone range, *Lazarides* 6386, 21.vii.1959 (CANB).

Previously recorded from Central Australia and northern South Australia, and recently collected in the Northern Territory; an uncommon species, largely confined to very rocky habitats of sandstone or quartzite. Diagnostic characters include the following: slender culms, narrow leaves and lemmas, slender awns, furrowed scabrous lemmas, lateral awns slightly shorter than the medians, fastigiately branched culms, and scanty linear panicles.

Aristida hirta Domin, Bibl. Bot. 85:339 (1915). Karunjie Station, on sandy soil, *Rust* 95, 7.iii.1950 (CANB).

A rarely occurring species previously recorded only from northern Queensland and since collected in the Northern Territory.

The species belongs in the section *Arthratherum* Henrard and shares with *A. superpendens* Domin the distinction of possessing long, strongly recurved central awns stouter than the laterals. From that species, however, *Aristida hirta* may be distinguished by its hairy (not scaberulous) culm and glabrous (not pubescent) collar.

Dichanthium aristatum (Poir.) C. E. Hubbard, Kew Bull. 1939:654 (1939). *Andropogon aristatum* Poir., Encyc. Suppl. 1:585 (1810).

Kimberley Research Station, occasional on grey heavy-textured soil, *Lazarides* 5022, 20.ix.1954 (CANB, BRI, NT, K, US).

Apparently of recent introduction in Western Australia; naturalised and widespread in Queensland. The dense patch of long hairs on the uppermost internode near the base of the inflorescence is unique among the Australian species.

Digitaria erirolepis Henr., Monogr. Gen. Digitaria, 819 (1950).

Nine miles N.E. of Kalumburu Mission, occasional in sandy creek-bed, *Lazarides* 4900B, 3.ix.1954 (CANB).

Only the type collection from northern Queensland previously recorded. The densely hairy spikelets with long, verrucose hairs are distinctive.

Digitaria gibbosa (R.Br.) Beauv., Agrost. 160 (1812). *Panicum gibbosum* R.Br., Prod. 193 (1810).

Six miles S.W. of Denham River Station, dominant in patches in deep yellow sand with *Eucalyptus grandifolia*, *Lazarides* 5045, 15.iv.1955 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

Commonly known from northern areas in Queensland and the Northern Territory. A slender annual species with solitary, linear racemes and characteristic spikelets; the spikelets are swollen at the base and become strongly gibbous with maturity; the lower lemmas are long ciliate on the margins, the hairs becoming firmly horizontal.

Digitaria papposa (R.Br.) Beauv., Agrost. 160 (1812). *Panicum papposum* R.Br., Prod. 192 (1810).

Spring Creek, Button's Gap, Ord River, sandy bank of creek, *Burbidge* 5693, 10.iv.1958 (CANB).

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Previously recorded only from islands in the Gulf of Carpentaria on the coast of Arnhem Land, Northern Territory. The species also occurs in northern Queensland. It is a tufted perennial with a pubescent root-base and the following diagnostic characters: spreading panicle with long racemes (up to 20 cm) which are whorled at the lower nodes and gradually become solitary upwards, densely and long hairy spikelets scattered along the racemes, slender usually elongated pedicels, and absent lower glume.

Digitaria robusta Hughes, Kew Bull. 1923:310 (1923).

Kimberley Research Station, *Langfield* 201, 14.ii.1950 (CANB).

Only the type collection from Melville Island, Northern Territory previously recorded. The species has since been collected in northern Queensland. Both the pedicelled and sessile spikelets bear sub-marginal bristles on the lower lemma in contrast to *D. ctenantha* (F. Muell.) Hughes, its closest affinity, in which the rigid bristles are absent from the sessile spikelet.

Eragrostis cumingii Steud., Syn. Pl. Glum. 1:266 (1854). *Eragrostis bleeseri* Pilger, Notizbl. Bot. Gart. Berlin 10:112 (1927).

Karunjie Station, on levee soil in irrigation plot, *Lazarides* 3144, 30.vi.1952 (CANB, BRI); Button's Gap, Ord River, Kimberley, silt near water course, *Burbidge* 5199, 17.iv.1956 and 5698, 10.iv.1958 (CANB).

The only previous Australian records comprise one record from Central Australia and Pilger's collection from the Northern Territory (Darwin). However, the species is common throughout Northern Australia and Malaysia. It is a slender, somewhat variable, annual which may be recognized by the following combination of characters: spikelets usually clustered on short branches in an interrupted panicle, lemmas granular with the lateral veins slightly nearer to the margins than to the midnerves, and palea ciliate on the keels with long, stiff hairs.

Steudel's name is based on Cuming's collections from the Philippine Islands which, according to information collected at Kew by Miss N. T. Burbidge, differ only slightly from Pilger's species.

Eragrostis tenax Jedw., Bot. Archiv 5:193 (1924).

Edkins River, 12 miles N.W. of Glenroy Meatworks, common on sandy river bank, *Lazarides* 5153, 22.iv.1955 (CANB, BRI, NSW, MEL, AD, PERTH, K, US).

Only the original collection from the Northern Territory previously recorded, but fairly common throughout northern Australia. It is a perennial species with distinctive terminal and axillary panicles, the latter in dense sessile clusters at the upper nodes, sometimes also a few enclosed in the basal leaf-sheaths.

Eriachne avenacea R.Br., Prod. 184 (1810).

19 miles S.E. of Kimberley Research Station, on deep sands with *Eucalyptus tetradonta* and *Sorghum* spp., *Perry* and *Lazarides* 2663, 31.vi.

1949; 25 miles N.E. of Karunjie Station, in lateritic yellow sandy soil, *Lazarides* 3090, 29.vi.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US); 74 miles S.W. of Kalumburu Mission, common in yellow gravelly podsollic soil with *Eucalyptus latifolia* and *Melaleuca* spp., *Lazarides* 4947, 6.ix.1954 (CANB, BRI, NT, NSW, MEL, AD, K, US); 0.5 mile S.W. of Bedford Downs Station, common in patches in skeletal soil with *Eucalyptus brevifolia* open woodland, *Lazarides* 5076, 17.iv.1955 (CANB, BRI, NSW, MEL, AD, PERTH, K, US).

Previously known from far northern areas in Queensland and the Northern Territory. The prominently 10-13-nerved glumes and long-acuminate (sometimes shortly awned) lemmas are characteristic.

Eriachne rara R.Br., Prod. 183 (1810).

Nine miles N.E. of Kalumburu Mission, in creek-bed but also common on deep red and yellow sands, *Lazarides* 4900A, 3.ix.1954 (CANB, BRI, NT, NSW, K, US).

Previously recorded from Queensland and the Northern Territory, mainly from near-coastal or insular districts. The plants have loose panicles, awned ciliate lemmas (the awns usually 10-15 mm long), and the glumes are glabrous or more often fringed along the margins with tubercle-based hairs.

Eriachne squarrosa R.Br., Prod. 183 (1810).

Karunjie Station, *Rust* 100, 7.iii.1950; Kimberley Research Station, *Langfield* 286, 1.iii.1952; Thompson's Springs, East Kimberley, on sandy soil, *Langfield* 345, 25.vii.1954 (CANB).

Previously known from the Northern Territory, northern Queensland, and New Guinea. Usually a perennial, the species may be recognised by its fairly tall habit, long awns (2-4.5 cm) on the lemmas, distinctly bifid palea, and densely hispid glumes.

Iseilema ciliatum C. E. Hubbard, Hook. Ic. Pl. 33:t.3286, 6 (1935).

Near Mt. House Station, common on heavy-textured gilgaied soil with *Astrebula squarrosa* grassland and sparse *Bauhinia cunninghamii*, *Lazarides* 5158, 23.iv.1955 and 5167, 24.iv.1955 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

Previously recorded only from the type locality (Mt. Walker) in northern Queensland; a solitary specimen has since been collected in the Northern Territory. The species is a coarse annual and distinctive within the genus by the following characters: lower glume of the involucre densely ciliate on the keels, scaberulous and deeply grooved on the back; margins of the leaves particularly near the base with scattered, long, slender, tubercle-based hairs.

Iseilema dolichotrichum C. E. Hubbard, Hook. Ic. Pl. 33:t.3285 (1935).

16 miles S.W. of Lamboo Station, dominant in small patches on skeletal slopes of low quartzitic hill with *Eucalyptus brevifolia*—*Triodia intermedia* open woodland, *Lazarides* 6322A, 13.vii.1959 (CANB); 8.5 miles W.N.W. of Mt. Amherst Station, common on stony patches in

Triodia wiseana—*T. intermedia* grassland, *Lazarides* 6349, 16.vii.1959 (CANB, BRI, NSW, MEL, AD, PERTH, K).

The only previous records comprise the type specimen from Duchess in Queensland and a single collection from Central Australia.

The species is one of the very few of the Australian representatives not confined to heavy soil grassland plains. It differs from the majority of *Iseilema* species in the very long basal hairs (up to 6 mm) of the racemes and from *I. eremaicum* S. T. Blake, its closest affinity, in the closely glandular keels of the spathes.

Iseilema windersii C. E. Hubbard, Hook. Ic. Pl. 33:t.3284 (1935).

Kimberley Research Station, on sandy loam, *Langfield* 66, 19.iii.1949 (CANB).

Previously recorded from Queensland, where it is common on heavy soil grassland plains of northern, western, and central-western districts, and Central Australia; also occurs in the Northern Territory. The species is allied to *I. ciliatum* but differs in the evenly pubescent lower glume of the involucre spikelet and absence of hairs on the margins of the leaves. The keels of the spathes are usually closely glandular and plants in the living state are often strongly aromatic.

Panicum seminudum Domin., *Bibl. Bot.* 85:320 (1915).

Point Springs, 24 miles N.E. of Carlton Station, East Kimberleys, sandy soil, *Langfield* 396 (CANB).

Originally described from northern Queensland (Yarraba) and recorded from the Northern Territory. The long lower glume (as long as the spikelet) is very distinctive. Its closest affinity is *Panicum delicatum* Hughes from which it differs in the larger spikelets (3.5 mm long).

Panicum trachyrhachis Benth., *Fl. Aust.* 7:490 (1878).

72 miles N.N.W. of Gibb River Station, common in floodout area of small creek on grey heavy-textured soil with *Arundinella nepalensis*, *Lazarides* 4961, 7.ix.1954 (CANB, BRI, NT).

Northern Territory and Queensland, mainly from near-coastal districts or higher rainfall areas of the interior.

Usually associated with watercourses and areas of periodic inundation where heights of six feet are commonly attained. The species is a robust tufted perennial with a spreading decompound panicle, scabrous panicle branches, acuminate lower glume as long as the spikelet and scaberulous on the tip, and broad (up to 2.5 cm) often tuberculate leaf sheaths.

Pseudopogonatherum irritans (R.Br.) A. Camus, *Ann. Soc. Linn. Lyon, n.s.*, 68:205 (1922). *Saccharum irritans* R.Br., *Prod.* 203 (1810). *Pollinia irritans* (R.Br.) Benth., *Fl. Aust.* 7:525 (1878).

55 miles S.W. of Kalumburu Mission, dominant in patches near water, also common in sandy seepage areas, *Lazarides* 4940, 6.ix.1954 (CANB).

Higher rainfall or coastal districts of the Northern Territory and Queensland, and New Guinea.

The species is distinctive by virtue of its biennial or perennial habit, larger spikelets, and longer denser spikes as compared with the other Australian representative *P. contortum*, an inland annual of Queensland and the Northern Territory.

Setaria apiculata (Scribn. & Merr.) K. Schum., *Just's Jahresb.* 28 (1): 417 (1900). *Chaetochloa apiculata* Scribn. & Merr., *U.S. Dep. Agric. Bull. Agrost.* 21:9 (1897).

Karunjie Station, on levee soil, *Lazarides* 3143, 30.vii.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US); 55 miles S.W. of Kalumburu Mission, common on sandy creek-banks and in depressions, *Lazarides* 4938, 6.ix.1954 (CANB, BRI, NT, K); 19 miles S.E. of Tableland Station, occasional on sandy levee soil with *Aristida hygrometrica* and *Eucalyptus papuana*, *Lazarides* 5108, 18.iv.1955 (CANB, BRI).

Apparently somewhat rare; previously known from Queensland and the Northern Territory. The broadly ovate spikelets are distinctive within the Australian representatives.

Sorghum verticilliflorum (Steud.) Stapf in Prain, *Fl. Trop. Afr.* 9:116 (1917). *Andropogon verticilliflorus* Steud., *Syn. Pl. Glum.* 1:393 (1854).

Fossil Downs Station, associated with *Sorghum sudanense* in irrigation plot, *Lazarides* 3135, 2. vii. 1952 (CANB, BRI).

A native of Africa; of recent introduction in Western Australia and New South Wales, but naturalised and widespread in Queensland, the species is allied to *Sorghum sudanense* and *S. halepense* but differs from the former in its perennial habit and stout culms and from the latter in the absence of rhizomes.

Triodia inutilis N. T. Burbidge, *Aust. J. Bot.* 1 (1): 163 (1953).

4 miles S. of Texas Downs Station, dominant on skeletal soil on shales with *Eucalyptus pruinosa*, *Lazarides* 3177, 14.vii.1952 (CANB, BRI, NT, NSW, K, US); 19 miles S.W. of Halls Creek Township, dominant on skeletal hill slopes on metamorphic rocks, *Lazarides* 6351, 16.vii.1959 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

Though not far removed from the type locality (Wave Hill) and the species' apparent centre of concentration in the Northern Territory, the above collections represent the western extremity of its known distribution.

The long, slender, drooping leaves and densely woolly sheaths are helpful field characteristics.

Confirmed Records

Chloris barbata (L.) Sw., *Fl. Ind. Occid.* 1:200 (1797). *Andropogon barbatus* L., *Pl. Jam. Pugill.* 30 (1759).

Kimberley Research Station, on river levee, *Langfield* 22; 202, 14.ii.1950; and 338, 30.viii.1953 (CANB).

Confirmed record for Western Australia; recorded by Gardner (1930, p. 11) and Specht (1958, p. 197), but later omitted by Gardner (1952). A widespread weed in the tropics of both hemispheres.

Ectrosia leporina R. Br., Prod. 186 (1810) var. **leporina** C. E. Hubbard, Hook. Ic. Pl. 34:t. 3312, 11 (1936).

55 miles S.W. of Kalumburu Mission, common in seepage area on sandy podsolic soil, *Lazarides* 4942, 6.ix.1954 (CANB, BRI, NT); 63 miles S.W. of Kalumburu Mission, dominant in broad shallow depression with *Alloteropsis semialata* and *Eucalyptus apodophylla*, *Lazarides* 4944, 6.ix. 1954 (CANB); 72 miles N.N.W. of Gibb River Station, common in sandy depressions, *Lazarides* 4963, 7.ix.1954 (CANB, BRI, NT); Karunjie Station, *Rust*, without number (CANB).

Confirmed record for Western Australia. Though listed by Gardner (1930, p. 10), the species was later omitted (Gardner 1952).

Widespread: northern areas of the Northern Territory, throughout Queensland, northern interior of New South Wales, and New Guinea. A perennial species which invariably grows in dense colonies over small areas. Panicles are dense and spike-like with short spikelets (usually 3-5 mm long) and smooth lemmas.

Paspalidium distans (Trin.) Hughes, Kew Bull. 1923:317 (1923). *Panicum distans* Trin., Sp. Gram. t.172 (1829).

50 miles S.S.E. of Kalumburu Mission, occasional in sandy creek-bed with *Elytrophorus spicatus*, *Lazarides* 4849, 1.ix.1954 (CANB).

Confirmed record for Western Australia; not mentioned by Gardner (1930, 1952), but recorded for "Kimberley, W.A." by Specht (1958). A widely distributed but erratically occurring species largely confined in Australia to higher rainfall or sub-coastal areas of the Northern Territory and Queensland; also known from New Guinea. It is a slender perennial with the following characteristics:— spikelets mostly biseriate in short, usually simple racemes; lower racemes interrupted along the main axis; upper glume shorter than the spikelet and exposing the transversely rugose upper lemma.

Pennisetum arnhemicum F. Muell., Fragm. Phyt. Aust. 8:109 (1873).

7 miles E. of Denham River Station on steep rocky volcanic slopes with *Eucalyptus brevifolia* and *Triodia* sp., *Perry* and *Lazarides* 2526, 19.vii. 1949 (CANB, BRI, NSW, MEL, AD, PERTH, NT, K, US); Winjinna Gorge, 41 miles S.E. of Napier Downs Station, amongst limestone boulders at base of Napier Range, *Lazarides* 3127, 25.vi.1952 (CANB, BRI, NT, NSW, MEL, K, US); 10 miles N.W. of Elgie Cliffs Station, occasional in skeletal sand amongst sandstone boulders, *Lazarides* 5095, 17.iv.1955 (CANB, BRI, NT, K, US); near Mt. House Station, common in rocky gorges and creeks on slopes of Mt. House with *Sorghum australiense* and *Pseudochaetochloa australiensis*, *Lazarides* 6442, 27.vii.1959 (CANB).

Confirmed record for Western Australia; recorded by Fitzgerald (1918, p. 114) and Gardner (1930) but later omitted (Gardner 1952).

Not uncommon in mountainous regions usually in habitats with better water relations and invariably in association with the rarely col-

lected *Pseudochaetochloa australiensis*; previously known from tropical areas of Queensland and the Northern Territory. The spike appears densely woolly due to the plumose involucreal bristles.

Supplementary Records

The following citations and notes are supplementary to existing scanty records.

Alloteropsis semialata (R. Br.) Hitchc., Contr. U.S. Nat. Herb. 12:210 (1909). *Panicum semialatum* R. Br., Prod. 192 (1810).

32 miles S.S.E. of Kalumburu Mission, occasional in grey heavy-textured soil, *Lazarides* 4877, 1.ix.1954 (CANB). Also observed 63 miles S.W. of Kalumburu Mission in association with *Ectrosia leporina*.

Only one previous record from Western Australia but widely distributed elsewhere:— northern areas of the Northern Territory, throughout Queensland, New South Wales, Malaysia. It differs from the other Australian species, *A. cimicina* (Retz.) Stapf, in its perennial habit and fibrous, woolly root-base.

Brachiaria ramosa (L.) Stapf in Prain, Fl. Trop. Afr. 9:542 (1919). *Panicum ramosum* L., Mant. 1:29 (1767).—var. **grandiflora** Hughes, Kew Bull. 1923:315 (1923).

Kimberley Research Station, *Langfield* 241, 27.i.1952 (CANB); 50 miles S.S.E. of Kalumburu Mission, occasional in sandy creek bed with annual grasses, *Lazarides* 4851, 1.ix.1954 (CANB, BRI, NT, NSW, K, US).

The only previous records comprise two collections from the Northern Territory and one from the Kimberleys; also occurs in Queensland. The species may be recognised by its semi-prostrate habit, broad pubescent leaves, several spreading racemes, and numerous evenly pubescent spikelets.

Brachiaria reptans (L.) C. A. Gardner & C. E. Hubbard, Hook. Ic. Pl. 34:t.3363, 3 (1938). *Panicum reptans* L., Syst. Nat. ed. 10, 2:870 (1759).

Ord River, 69 miles S. of Kimberley Research Station, on river bank, *Lazarides* 2963, 11.vii. 1952 (CANB, BRI); Kimberley Research Station, on sandy loam, *Langfield* 38, 13.i.1949, 75, 4.iii. 1949, and 153, 14.ii.1950 (CANB).

Only one previous Western Australian record but known from the Northern Territory and Queensland and widespread in the tropics of both hemispheres. The spikelets are the smallest (1.5 mm long) among the Australian species.

Chloris pumilio R. Br., Prod. 186 (1810).

10 miles S.E. of Mt. House Station, codominant with *Eriachne glauca* on creek banks and in depressions, *Lazarides* 5157, 22.iv.1955 (CANB, BRI, NT, SW, MEL, AD, PERTH, K, US).

An uncommon species previously known from northern Queensland, coastal areas of the Northern Territory, and from one collection in the Kimberleys. The species is allied to *C. ruderalis* Domin but differs in the sub-equal (not distinctly unequal) awns of the lemma.

Chrysopogon latifolius S. T. Blake, Univ. Qd Papers, Dep. Biol. 2(3):7 (1944).

42 miles S.S.E. of Kalumburu Mission, common in red gravelly soil with *Eucalyptus tectifica* and *Sorghum australiense*, *Lazarides* 4868, 1.ix.1954 (CANB); 32 miles S.S.E. of Kalumburu Mission, occasional in grey heavy textured soil, *Lazarides* 4876, 1.ix.1954 (CANB, BRI, NT); 16 miles S.E. of Mt. House Station, dominant on creek bank with *Eriachne* spp., *Lazarides* 5156, 22.iv.1955 (CANB, BRI, NT, K).

Previously known from two Kimberley collections and the Northern Territory but not common in the latter area. The species occurs on a wide range of soils and habitats but invariably near permanent streams. The broad, flat, many-nerved leaves and the numerous panicle-branches in each whorl are distinctive features.

Echinochloa stagnina (Retz.) Beauv., Agrost. 161 (1812). *Panicum stagninum* Retz., Obs. 5:17 (1789).

"The Razorbacks" near 65 m. peg on Wyndham-Darwin road, swamps on heavy grey clay, *Burbidge* 5185, 17.iv.1956 (CANB).

First recorded only recently for Australia as well as for Western Australia and Queensland by Blake (1952, p. 91) from two collections. This is the third collection. The species is considered a weed in rice-growing projects of northern Australia.

Eriachne fastigiata Lazar., J. Roy. Soc. W. Aust. 42(2):33 (1959).

Based on two collections from the Kimberleys (Glenroy). From observations made during the 1959 field season, the species is common in the Glenroy-Tableland-Napier Downs area and confined almost wholly to shallow soils developed on shales.

Eriachne festucacea F. Muell., Fragm. Phyt. Aust. 5:205 (1866).

31 miles S.E. of Kimberley Research Station, in small rocky creek in dissected quartzite area, *Lazarides* 2664, 31.vii.1949 (CANB, BRI, NT, NSW, MEL, AD, K, US); 50 miles S.S.E. of Kalumburu Mission, dominating rocky creek beds in hilly volcanic area, *Lazarides* 4848, 1.ix.1954 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US); 9 miles N.W. of Elgie Cliffs Station, dominating sandy or rocky river beds, *Lazarides* 5092, 17.iv.1955 (CANB, BRI, NT).

Confined to the Kimberley District and adjacent parts of the Northern Territory. The widely-divergent lemmas and paleas, glabrous glaucous culms, convolute leaves, and broad leaf-sheaths abruptly contracted at the ligule are important diagnostic characters; a characteristic species in beds of permanent streams.

Heterachne gulliveri Benth., Hook. Ic. Pl. 13: 39, t. 1250 (1877).

8 miles S.E. of Tableland Station, common in sandy depressions with *Aristida hygrometrica*, *Lazarides* 5120, 18.iv.1955 (CANB, BRI, NT).

A selective species of sandy habitats with good water relations; previously known from northern Queensland and just beyond the border in the north-eastern corner of the Northern Territory and from one locality in Western Australia. The spikelets are the

smallest (2-2.5 mm long and wide) within the genus. Other distinctive characters include narrow interrupted panicles, orbicular spikelets, and ciliate lemmas and paleas.

Iseilema filipes S. T. Blake, Univ. Qd Papers, Dep. Biol. 2(3):60 (1944).

16 miles S. of Kalumburu Mission, common in heavy volcanic soil and nearby stony creeks, *Lazarides* 4969, 9.ix.1954; 64 miles S. of Kalumburu Mission, common throughout volcanic areas in rocky creek beds, *Lazarides* 4838, 31.viii.1954 (CANB).

Previously known only from the type collection. The elongated, slender peduncles (3-4.5 cm long) are unique within the genus.

Panicum pauciflorum R. Br., Prodr. 191 (1810).

4 miles N.W. of Elgie Cliffs Station, occasional on rock quartzite slopes with *Plectrachne pungens*, *Lazarides* 6391, 21.vii.1959 (perennial form) (CANB).

Previously recorded (*Lazarides* 1959 p. 338) in Western Australia from only two localities. The above locality represents the western extremity of the species present distribution range; known also from the Northern Territory and Queensland.

Plectrachne bynoei C. E. Hubbard, Kew Bull. 1: 30 (1941).

Thompson's Springs, 42 miles S.E. of Kimberley Research Station, on steep rocky cliff, *Lazarides* 2945, 10.vii.1952 (CANB, BRI, PERTH, K); Martin's Gap, E. of Ord River, western slope of rocky hill, *Burbidge* 5137, 14.iv.1956 (CANB).

Though rarely collected previously, the species is common on rugged, sandstone slopes of major mountain systems such as the Durack and Carr Boyd Ranges. The single-awned lowest lemmas are unique within the genus. No previous mention has been made of the extremely resinous, shiny leaf-blades and sheaths, a character prominently evident on *Lazarides* 2945, and the glumes of all collections seen are much shorter (less than 5 mm) than that given in previous descriptions. Only the type collection from the Kimberleys previously recorded but since collected in adjacent parts of the Northern Territory.

Plectrachne schinzii Henr., Vierteljahrsschr. Nat. Ges. Zurich 62:132 (1929).

5 miles S.E. of Gordon Downs Station, on deep sandy soil with *Acacia* spp. and *Plectrachne* spp., *Perry* and *Lazarides* 2470, 14.vii.1949 (CANB, BRI, NT, K, US); 9 miles S.W. of Oobagooma Station, common on sand dunes on edge of salt marsh, *Lazarides* 3124, 22.vi.1952 (CANB, BRI, NT).

The latter locality is well north of previous Western Australian records. The species is well developed in northern Central Australia with isolated occurrences in the Northern Territory as far north as Victoria River Downs Station.

Pseudochaetochloa australiensis Hitchc., J. Wash. Acad. Sci. 14:492 (1924).

Terroni Gorge, 10 miles N.W. of Elgie Cliffs Station, occasional in skeletal sand amongst sandstone boulders, *Lazarides* 5096, 17.iv.1955

(CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US); Durack Range, 8.5 miles S.E. of Bedford Downs Station, common in stony creek from gorge in sandstone range with *Pennisetum arnhemicum* and dense mixed vegetation, *Lazarides* 6383, 21.vii.1959 (CANB, BRI, NSW, MEL, PERTH, K, US).

Previously recorded from only two Kimberley collections. However, the species is not uncommon in better watered, rocky habitats of rugged, usually sandstone mountain systems. Both cited collections possess only male florets.

Sacciolepis indica (L.) Chase, Proc. Biol. Soc. Wash. 21:8 (1908). *Panicum indicum* L., Mant. 2:184 (1771).

2 miles N. of Gibb River Station, common near spring in sandy soil with *Ischaemum* spp., *Lazarides* 4988, 11.ix.1954 (CANB); 6 miles W. of Tableland Station, common in deep sand near small creek with mixed forbs and grasses, *Lazarides* 6407, 22.vii.1959 (CANB, PERTH, US).

Only one previous record from Western Australia, but widespread elsewhere: northern Australia, throughout Queensland, coastal New South Wales, New Guinea; confined to water-courses or similar situations.

Sacciolepis myosuroides (R. Br.) A. Camus in Lecomte, Fl. Gen. Indo-Chine 7:460 (1922). *Panicum myosuroides* R. Br., Prod. 189 (1810).

55 miles S.W. of Kalumburu Mission, common in sandy seepage area, *Lazarides* 4943, 6.ix. 1954 (CANB, BRI, NT).

Widespread throughout tropical Australia in similar habitats as the above species but usually less common; also known from New Guinea, tropical Asia, and Africa. It differs from the only other Australian representative in the smaller (1 mm long), more rounded, blunter spikelets. Both species are slender annuals with dense, spiciform panicles which may be elongated to 9 cm in *S. indica*, and to 15 cm in *S. myosuroides*.

Sclerandrium truncatiglume (Benth.) Stapf et C.E. Hubbard, Hook. Ic. Pl. 33:t. 3262 (1935). *Ischaemum truncatiglume* F. Muell. ex Benth., Fl. Aust. 7:518 (1878).

Carson River, 38 miles S.S.E. of Kalumburu Mission, common on sandy river bank near water, *Lazarides* 4869, 1.ix.1954 (CANB, BRI, NT, K); Thompson's Springs, 42 miles S.E. of Kimberley Research Station, *Lazarides* 3136, 6.vii.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

Previously known from isolated occurrences in the Kimberleys and the Northern Territory; the species has a disjunct distribution in the higher rainfall tropics of northern Australia and extends to New Guinea. The species, a tussocky perennial 90-130 cm high with 3-6 fascicled, spiciform, brown racemes, is invariably associated with permanent surface waters.

Thaumastochloa pubescens (Domin) C.E. Hubbard, Hook. Ic. Pl. 34:t.3313 (1936). *Ophiuros pubescens* Domin, Bibl. Bot. 85:262 (1915).

Karunjie Station, *Rust* 33, 1.iii.1950; near Kimberley Research Station, open gully in sandstone cutcrop, *Burbidge* 5712 and, open ground

under savannah near sandstone ridge, 5719, 12. iv.1958 (CANB).

The only Western Australian record is based on fragmentary material; also known from the Northern Territory and Queensland. The species has affinities with *T. constricta* S. T. Blake but differs in the rugose or tuberculate lower glumes and glabrous, smooth, less constricted internodes of the spike.

Thaumastochloa rariflora (F. M. Bail.) C. E. Hubbard, Hook. Ic. Pl. 34:t.3313 (1936). *Rottboellia rariflora* F. M. Bail., Qd Dep. Agric. Bot. Bull. No. 8: 86 (1893).

11 miles N.E. of Tableland Station, common in deep yellow sands with *Eucalyptus ferruginea* and *Aristida hygrometrica*, *Lazarides* 6404, 22.vii. 1959 (CANB).

Only one previous record from Western Australia and rarely collected in the Northern Territory, but commonly known from northern Queensland. The curved, elongated peduncles (up to 7 cm long), reduced spikes of 1-2 spikelets, and smooth lower glume are diagnostic characters.

Themeda avenacea (F. Muell.) Dur. & Jacks., Index Kewensis Suppl. 1, 424 (1906) *Anthis-tiria avenacea* F. Muell., Fragm. Phyt. Aust. 5:206 (1866).

7 miles N.W. of Bylina Station, dominant in depressions in gilgaied heavy soil plain, *Lazarides* 3130, 26.vi.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

A new record for the Northern Province of Western Australia; widespread throughout Australia except Victoria and Tasmania.

Triodia fitzgeraldii N.T. Burbidge, J. Roy. Soc. W. Aust. 30:25 (1946).

Dillon's Springs, 46 miles S.E. of Wyndham Township, common on rocky skeletal slope of sandstone hill with *Triodia plectrachnoides*, *Lazarides* 3169, 10.viii.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

This collection from the type locality is only the second record for the species. The following notes are taken from a field description of the above collection:— "Tussocks 1 ft high and 18 in. wide. Flowering culms 2 ft high. Lamina dark-green, terete, strongly pungent, non-resinous."

Triodia inaequiloba N.T. Burbidge, Aust. J. Bot. 8:391 (1960).

Only the type collection known. At the type locality (Mt. Amherst Range), the species dominates a narrow zone on the upper granitic slopes immediately below the scarp. The species grows in large tussocks 1½-3 ft high and 3-4 ft in diam. with flowering culms 3-4 ft high and bright green, non-resinous, erect leaves.

Triodia intermedia Cheel, K. svenska Vetensk.-Akad. Handl. 52 (10):4-5 (1916).

10 miles N. of Fitzroy Crossing Township, common on red soil on limestone, *Lazarides* 3102, 17.vi.1952 (CANB, BRI, NT, MEL, K, US); 10 miles S.W. of Calwynyardah Station, dominant on yellow podsollic soil, *Lazarides* 3107, 17.vi.1952 (CANB, BRI, NT, MEL, NSW, AD,

K, US); 44 miles S. of Denham River Station, dominant on skeletal soil on igneous rocks, *Lazarides* 3176, 13.viii.1952 (CANB, BRI, NT, K, US).

The species is more common in the strongly dissected Halls Creek area, where it dominates very large areas in association with *Eucalyptus brevifolia* open woodland, than in the Fitzroy River basin from which it was originally recorded; an endemic of the Kimberley District and adjacent areas of the Northern Territory. The prominently winged palea provides an easily recognizable characteristic.

Triodia racemigera C. A. Gardner, Fl. W. Aust. 1(1):77 (1952).

10 miles N.E. of Flora Valley Station, dominant on volcanic outcrops with *Eucalyptus terminalis*, *Lazarides* 3183, 20.viii.1952; "The Razorbacks" near 65 mile peg on Wyndham-Darwin road, Kimberley, crevice in rock face, *Burbidge* 5189, 17.iv.1956; near Kimberley Research Station, Ord River, exposed slope under sandstone cliff, *Burbidge* 5721, 12.iv.1958 (CANB).

The above collections represent the second record for the species; also occurs in the Northern Territory. Field notes taken from No. 3183 include the following:—"Tussocky perennial with flowering culms 2-3 ft high. Tussocks up to 6 in. high and 1 ft wide."

Triodia roscida N. T. Burbidge, Aust. J. Bot. 1(1):176 (1953).

7 miles N.E. of Flora Valley Station, occasional on stony alluvial creek bank, *Lazarides* 3184,

20.viii.1952 (CANB, BRI, NT, NSW, MEL, AD, PERTH, K, US).

Previously known from Western Australia and the Northern Territory, each from a single collection.

Triodia wiseana C.A. Gardner, J. Roy. Soc. W. Aust. 27:166 (1942) var. **brevifolia** N.T. Burbidge, J. Roy. Soc. W. Aust. 30:24 (1946).

21 miles N. of Fitzroy Crossing township, common on brown calcareous desert soil, *Lazarides* 3103, 17.vi.1952 (CANB).

New record for the Kimberley district; previously known only from the extreme south-west of the Northern Province.

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